



Urban land expansion under economic transition in China: A multi-level modeling analysis[☆]



Zhiji Huang^{a, b}, Yehua Dennis Wei^{c, d, *}, Canfei He^{a, b}, Han Li^d

^a College of Urban and Environmental Sciences, Peking University, Beijing 100871, China

^b Peking University-Lincoln Institute Center for Urban Development and Land Policy, Beijing 100871, China

^c Department of Land Management, Zhejiang University, Hangzhou 310029, China

^d Department of Geography, University of Utah, Salt Lake City, UT 84112-9155, USA

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ABSTRACT

China is undergoing an unprecedented urbanization process in which massive amounts of rural land has been converted to urban use. Indeed, rapid urban land expansion in China has generated heightened concerns over consequences of urbanization and challenges to sustainability and public policy. This study applies the triple transition framework of globalization, marketization, and decentralization to study how economic transition influences urban land expansion in China. Using official land use conveyance data from 2005 to 2008, we have found that significant spatial variation at both provincial and prefectural levels exist in urban land expansion. Regression analysis at the prefectural level reveals that the theoretical framework explains urban land expansion. While marketization is more important to overall urban land expansion, globalization plays a critical role in industrial land expansion. Further applying a multi-level modeling analysis, we find that two-level modeling can considerably improve the model and, more importantly, decentralization significantly contributes to the expansion of construction and industrial land. These results indicate that China's process of urban land expansion is influenced by global forces (globalization), the transition from a socialist to a market economy (marketization), and the process of decentralization dismantling totalitarianism of socialism and mobilizing local resources for development. We argue for integrating global and local forces to more fully understand urbanization process and sustainability challenges.

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Introduction

China has experienced unprecedented economic growth and urbanization since 1978. After more than 30 years of development, more than half of the people in China are now living in cities in 2012, and urbanization has become one of the core subjects on the policy agenda of the new leadership of China (Wei & Ye, 2014). The process and consequences of the rapid urbanization in China have

attracted many scholars' attention. Some scholars emphasize the effect of globalization on China's urbanization (Shen, Wong, Chu, & Feng, 2000; Sit & Yang, 1997). Sit and Yang (1997) introduce the concept of foreign-investment-induced exo-urbanization to capture the distinct character of urbanization in the Pearl River Delta of South China. Globalization has enhanced economic restructuring, rural industrialization, the emergence of an export-oriented economy and its rapid integration within the world economy. Some scholars study the pattern and process of rural to urban migration (Fan, 2008) and view it as the main force of China's urbanization. Attention has also been paid to the institutional and political economy perspectives. Research points to the indisputable role of the state in the globalization and transformation of Chinese cities, with notions such as local state corporatism, embedded globalization, transitional institutions, expo-urbanization and dual-track urbanization (Oi, 1999; Wei, 2005). The Chinese state has been transformed from a socialist state and a provider of public goods to a developmental/entrepreneurial state that actively

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* Corresponding author. Department of Land Management, Zhejiang University, Hangzhou 310029, China.

E-mail addresses: zjhuang@pku.edu.cn (Z. Huang), wei@geog.utah.edu (Y.D. Wei), hcanfei@urban.pku.edu.cn (C. He), han.li@geog.utah.edu (H. Li).

promotes globalization, economic development, and urban growth (Wei, 2005, 2012). Accordingly, Chinese cities have become transitional cities, developmental/entrepreneurial cities, and globalizing cities (Wei & Ye, 2014). Finally, in the perspective of neoliberalism, Lin, Li, Yang, and Hu (2014) argue that Chinese urbanism can be considered a particular variety of neoliberalism in which increased marketization and commodification have taken place, not in an effort to undermine state power capacity, but rather to function as a means for local governments to contest the rescaling of state power.

Urban land expansion has been one of the most remarkable processes of urban transformation since the launch of economic reforms in the late 1970s, resulting in impressive conversion of land from agricultural production into urban development and great loss of cultivated land in China (Lin, 2007; Lin & Ho, 2005; Song, 2014). The existing literature largely focuses on modeling the patterns, mechanisms, and effects of urban growth and land use expansion in China, following the neoclassical perspectives and relying heavily on modeling, Geographic Information System (GIS), and remote sensing techniques (e.g. Luo & Wei, 2009; Shu, Zhang, Li, Qu, & Chen, 2014). These studies have identified population urbanization, industrialization, and economic restructuring and growth as the demand forces underlying urban land use expansion (Chen, Chang, Karacsonyi, & Zhang, 2014; Deng, Huang, Rozelle, & Uchida, 2010; Jiang, Deng, & Seto, 2012). Recent studies have also broadened the scope of the attention to the political and institutional perspectives, especially under the concept framework of neo-liberalization (Lin et al., 2014). Land use has been seen as an instrument for the local governments to attract foreign and local investment and increase local revenue income to promote local economies (Lin & Ho, 2005; Liu, Zhan, & Deng, 2005; Ping, 2011; Tao, Su, Liu, & Cao, 2010).

The existing studies have provided some explanations of China's rapid urban expansion and the conversion of agricultural land to urban use. However, the existing literature suffers several limits. First, there is a lack of systematic theoretic framework to study urban land expansion under economic transition in China. Existing literature provides a weak overall explanation. Second, land use data from remote sensing can only be used to detect the overall built-up areas of cities, but cannot recognize the different types of land use, such as urban land and industrial land use, which are also important to urbanization and urban expansion. Finally, few efforts have been made to investigate the effect of the administrative hierarchy on urban land expansion using multi-level modeling.

This study examines the effects of economic transition, conceptualized as a triple process of globalization, decentralization and marketization (Wei, 2000, 2001), on urban land expansion based on different types of urban land use. Using official land change data, we analyze rapid urban land expansion spatially, both at the provincial and prefectural levels, and apply a multi-level modeling analysis of the prefecture-level and above cities during 2004 and 2008 to explore systematic forces driving urban land expansion in transitional China. We develop a new systematic framework to understand urban land expansion under economic transition, and our findings suggest there are different temporal-spatial multi-mechanisms for different types of urban land expansion in Chinese cities.

Economic transition and urban land expansion

Economic transition has significantly promoted economic growth and induced impressive urban transformation in China by introducing new elements of development in China, which has been conceptualized as the triple process of marketization, globalization, and decentralization (Wei, 2000, 2001). This transition

has altered in significant ways how China uses its land, leading to significant urban development and land use change. Globalization, focusing on the foreign investment and trade, integrates the Chinese economy into the world economy and opens China to global competition, which has dramatically increased the demand for land. Decentralization grants much authority and responsibility to local governments and more actively promotes the development of land market to provide economic incentives and meet fiscal need. Decentralization, together with the incentive of political promotion, has also induced fierce inter-regional competition, causing local governments to use cheap industrial land to attract foreign and domestic investment in order to promote economic growth, leading to dramatic urban land expansion. Marketization encourages urban land expansion through industrialization and the establishment of private enterprises, which increases land demand as well. Marketization also encourages the establishment of urban land market to increase land supply. The theoretical framework for analyzing urban land expansion under economic transition is presented in Fig. 1.

Globalization and urban land expansion

One of the significant changes in transitional China is the increasing integration of the Chinese economy into global competition (He & Zhu, 2007). China has participated in the globalization process by implementing a series of “open door” and reform policies to attract foreign investment and increase trades since the late 1970s (Wei, 2000). Globalization has been identified as the main cause of the faster urban land expansion in the eastern and southern provinces of China (Jiang et al., 2012; Lin, 2007; Seto & Kaufmann, 2003). For instance, Su (2005) shows that more than 23% of the farmland was converted for FDI in Guangdong Province; and in Dongguan, a city in Guangdong, the loss of agricultural land has been reported at approximately 70%. Jiang et al. (2012) show that a 10% increase in foreign direct investment is associated with a 2.38% increase in the amount of cultivated land converted. Lin (2006) argues that the spread of global capitalism is one of the most important conditions facilitating peri-urbanism in Dongguan in the Pearl River Delta, resulting in rapid urban land expansion in the region.

Globalization has impacted every aspect of economic development in contemporary China, especially in urban development (Wei, 2012). FDI has exerted an enormous impact on the development of Chinese cities, transforming them from transitional cities to globalizing cities. The elements of globalization which affect urban development include the globalization of business location and production, the advancement in infrastructure for the transmission of information and mobility of goods, and the ease and convenience of processing financial transaction globally (Scott, Agnew, Soja, & Storper, 2001).

Globalization can cause urban land expansion in many ways. First, with the influence of global market forces, the reform of China's land system took place first in special economic zones and coastal open cities, with the gradual establishment of land market. The landmark event took place in Shenzhen Special Economic Zone on 9 September 1987, when the use right to land was first sold to commercial land users to accommodate the demand of foreign investors (Lin & Ho, 2005). The separation of land use rights from the land ownership was developed to accommodate the needs of foreign direct investments (FDI) and allowed foreign investors to access land by leasing them for a certain period of time. Due to the global force, toward an urban land market system, marked a new era of land policy in modern China (Ding, 2007).

Second, in order to attract foreign direct investment and promote export, local governments have tremendous interest to

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